REMARKS

A. Objections to Drawings

In the Office Action mailed on April 10, 2003, the drawings were objected to for lacking numerals 114; 407; 411; 429; 434 and 458.

Regarding numeral 114, FIGS. 1(a)-(c) have been amended to include numeral 114 in accordance with page 4 of Applicants' specification.

Regarding numeral 407 it is present in FIG. 20(b). Regarding numeral 411 it is present in FIGS. 23(a) and 23(c).

Regarding numeral 429, FIG. 18 has been amended to include numeral 429 in accordance with page 35 of Applicants' specification.

Regarding numeral 434, it is incorrectly used in the specification. Accordingly, the specification has been amended to replace numeral "434" with numeral "424."

Regarding numeral 458, it is incorrectly used in the specification. Accordingly, the specification has been amended to delete numeral "458."

The drawings were objected to for not showing an alignment laser. Applicants traverse this objection in that an embodiment of an alignment laser is shown in FIG. 3.

The drawings were objected to for not showing an x-ray source coincident with a radiation source. Claim 30 has been amended to clarify that the x-ray source rotates about an axis that is coincident with an axis of rotation of the radiation source. Since this is shown in FIG. 17a, the objection has been overcome and should be withdrawn.

The drawings were objected to for not showing a gantry attached to a wall of a room. Claims 24 and 25 have been canceled and so the objection has been overcome and should be withdrawn.

The drawings were objected to for not showing a gantry rotating about a second axis of rotation. Applicants traverse this objection in that an embodiment of a gantry that rotates about two axes is shown in FIG. 22.

The drawings were objected to for not showing a gantry attached to a mobile platform. Applicants traverse this objection in that an embodiment of a gantry attached to a mobile platform is shown in FIG. 22.

The drawings were objected to for failing to show various movements of an x-ray source and an imager. Applicants traverse this objection since the recitation of movements do not regard a specific structure and so are not subject to 37 CFR 1.83(a).

B. Objections to Claims

Claims 13, 69 and 75 were objected to for matters of form. In particular, claim 13 was objected for reciting "said source plane." Claim 13 has been amended to delete the offending phrase. Accordingly, the objection has been overcome and should be withdrawn.

Claim 69 has been objected to for depending on claim 63 instead of claim 66. Applicants traverse the objection to the extent that claim 69 depends indirectly on claim 63 via dependent claim 66. Despite the impropemess of the objection, claim 69 has been amended to be in independent form and to include the elements of claims 63 and 69 only in order to obtain broader coverage for the invention of claim 69. Accordingly, the objection should be withdrawn.

Since claim 69 has been amended to incorporated elements inherently present in the claim, such amendments are not related to patentability as defined in *Festo Corporation v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd*, 234 F.3d 558, 56 USPQ2d 1865 (Fed. Cir. 2000) (*en banc*), *overruled in part*, 535 U.S. 722, 122 S. Ct. 1831 (2002).

Claim 75 was objected to for having insufficient antecedent for the limitation "said animal." Claim 75 has been amended to depend from claim 74 instead of claim 63. Since claim 74 recites an animal, there is proper antecedent basis for "said animal" and so the objection has been overcome and should be withdrawn.

Claim 75 has been amended so as to provide additional coverage for the method of treating an object with radiation of claim 69. Accordingly, the amendment is not being made for reasons of patentability as defined in *Festo*.

C. 35 U.S.C. § 103

1. Swerdloff et al. and Roos et al.

a. Claims 1, 5, 11, 14-20, 28, 30, 31 and 35

Claims 1, 5, 11, 14-20, 28, 30, 31 and 35 were rejected under 35 U.S.C. § 103 as being obvious in view of Swerdloff et al. and Roos et al. Applicants traverse this rejection. In particular, claim 1 recites a cone-beam computer tomography system. The Office Action has

conceded that Swerdloff et al. does not discloses a cone-beam computer tomography system. Indeed, Swerdloff et al. discloses a tomographic imaging system that produces tomographic or slice images of a slice of a patient. (Col. 6, ll. 27-34). In operation, the patient is positioned on the table 101 and a slice image is taken. Next, the table 101 is incrementally moved to a second position so that a second slice image is taken. This process is repeated until multiple slice images are obtained as shown in FIGS. 13-14. (Col. 7, ll. 39-58). As mentioned on page 5, lines 20-23 of Applicants' specification, a system like Swerdloff et al. operates by having one or more 2-D slices reconstructed from the one dimensional projections constructed from 'fan-beams' and then stacking the 2-D slices upon one another. One of ordinary skill in the art would understand that Swerdloff et al.'s slice-by-slice imaging process is not the same as a cone-beam computer tomography system as recited in claim where the table is held stationary during the imaging process. As explained on page 5 of Applicants' Specification, a cone-beam computer tomography system reconstructs three-dimensional images from a plurality of two dimensional projection images formed at various angles about the subject being imaged.

Roos et al. does not cure the deficiencies of Swerdloff et al. While Roos et al. discloses a computerized tomography system, there is no motivation to replace Swerdloff et al.'s slice-by-slice imaging process with Roos et al.'s computerized tomography system. Indeed, such a replacement would be such a radical departure from Swerdloff et al.'s slice-by-slice imaging system that it would render Swerdloff et al.'s therapy planning software ineffective since it is based on slice-based data and not cone beam image data. (See Cols. 7-13 of Swerdloff et al.) Since there is no motivation to replace Swerdloff et al.'s imaging system with Roos et al.'s imaging system, the rejection is improper and should be withdrawn.

The rejection of claim 1 is traversed for the additional reason that neither Swerdloff et al. nor Roos et al. suggest having a computer receives an image of the object and based on the image send a signal to the radiation source that controls the path of the radiation source as recited in claim 1. The Office Action has relied on the passage at column 7, lines 9-19 of Swerdloff et al. as disclosing such a computer and such a signal. However, the passage only relates to how a fluence profile describes the desired intensity of each ray from the source for a particular gantry angle and at a given position of the patient table. Nowhere does this passage indicate that a computer sends a signal to control the path of the radiation based on the image from a computerized tomography system. While FIG. 4 of Swerdloff et al. shows a computer 51 in

communication with a gantry control 54, there is no disclosure in Swerdloff et al. that control of the gantry is based on an image. Indeed, Swerdloff et al. relies on a human operator to determine the areas where radiation is to be delivered. (Col. 2, l. 63-Col. 3, l. 16, Col. 14, l. 8- Col. 16, l. 8). Since Roos et al. also does not suggest having a radiation path being controlled by a computer based on an image, the rejection of claim 1 is improper for this reason as well.

b. Claims 63, 64, 66-69 and 73-76

Claims 63, 64, 66-69 and 73-76 were rejected under 35 U.S.C. § 103 as being obvious in view of Swerdloff et al. and Roos et al. Applicants traverse this rejection for several reasons. First, claim 63 recites forming computer tomography image by and the Office Action has asserted that Swerdloff et al. discloses forming a computer tomography image. As pointed out above in Section C.1.a, this is not true. One of ordinary skill in the art would understand that Swerdloff et al.'s slice-by-slice images are not the same as a computer tomography image as recited in claim 63.

The rejection also asserts that Swerdloff et al. controls the path of the radiation source based on the image based on the passage at column 7, lines 9-19. As pointed out above in Section C.1.a, this passage does not disclose controlling a path of radiation .

Roos et al. does not cure the deficiencies of Swerdloff et al. While Roos et al. discloses forming computerized tomography image, there is no motivation to replace Swerdloff et al.'s slice-by-slice images with Roos et al.'s computerized tomography image. Indeed, such a replacement would be such a radical departure from Swerdloff et al.'s slice-by-slice imaging system that it would render Swerdloff et al.'s therapy planning software ineffective as mentioned above in Section C.1.a. Furthermore, Roos et al. does not disclose or suggest controlling the path of radiation of Swerdloff et al. based on an image. Since there is no motivation to replace Swerdloff et al.'s image with Roos et al.'s image and there is no motivation to control the radiation path of Swerdloff et al. based on an image, the rejection is improper and should be withdrawn.

Note that claim 63 is being canceled in order to prosecute prosecution of the present application. The cancellation of claim 63 is not related to patentability since the rejection of claim 63 is improper because the rejection fails to recite art that suggests controlling a radiation path based on an image. Accordingly, the cancellation of claim 63 is not related to patentability as defined in *Festo.*

Claims 64-66, 71 and 74 have been amended so as to depend from claim 69 and to provide further protection for the method of treating recited in claim 69. Accordingly, their amendments are not related to patentability as defined in *Festo*

Claim 69 has been amended so as to incorporate elements that are inherently present in the claim. Accordingly, the amendment of claim 69 is not related to patentability as defined in *Festo*..

2. Swerdloff et al., Roos et al. and Cullity

Claims 2, 3 and 7 were rejected under 35 U.S.C. § 103 as being obvious in view of Swerdloff et al., Roos et al. and Cullity. Applicants traverse this rejection. Claims 2, 3 and 7 depend directly or indirectly on claim 1. As pointed above in Section C.1.a, there is no motivation to replace Swerdloff et al.'s imaging system with the imaging system of Roos et al. Cullity also does not cure the deficiencies of Roos et al. since it does not suggest replacing Swerdloff et al.'s slice-by-slice imaging system with a computer tomography system as recited in claim 1. Accordingly, the rejections of claims 2, 3 and 7 are improper for at least the same reasons stated above in Section C.1.a.

3. Swerdloff et al., Roos et al. and Rand et al.

Claims 4 and 9 were rejected under 35 U.S.C. § 103 as being obvious in view of Swerdloff et al., Roos et al. and Rand et al. Applicants traverse this rejection. Claims 4 and 9 depend directly or indirectly on claim 1. As pointed above in Section C.1.a, there is no motivation to replace Swerdloff et al.'s imaging system with the imaging system of Roos et al. Rand et al. also does not cure the deficiencies of Roos et al. since it does not suggest replacing Swerdloff et al.'s slice-by-slice imaging system with a computer tomography system as recited in claim 1. Accordingly, the rejections of claims 4 and 9 are improper for at least the same reasons stated above in Section C.1.a.

4. Swerdloff et al., Roos et al. and Dobbs

a. Claims 6, 8, 10 and 12

Claims 6, 8, 10 and 12 were rejected under 35 U.S.C. § 103 as being obvious in view of Swerdloff et al., Roos et al. and Dobbs. Applicants traverse this rejection. Claims 6, 8, 10 and 12 depend directly or indirectly on claim 1. As pointed above in Section C.1.a, there is no motivation to replace Swerdloff et al.'s imaging system with the imaging system of Roos et al.

Rand et al. also does not cure the deficiencies of Roos et al. since it does not suggest replacing Swerdloff et al.'s slice-by-slice imaging system with a computer tomography system as recited in claim 1. Accordingly, the rejections of claims 6, 8, 10 and 12 are improper for at least the same reasons stated above in Section C.1.a.

The rejections of claims 6, 8 and 10 are improper for the additional reason that there is no suggestion in Dobbs or Roos et al. to alter Swerdloff et al.'s table rotate about an axis. As shown in Swerdloff et al., the patient is contained within a ring. Rotating of the table would result in the patient to fall off the table, which is not desirable. Furthermore, there is no motivation to place the rotatable seat of Dobbs within the ring of Swerdloff et al. since there would be no room to fit the patient. Accordingly, there is no motivation to either rotate the table of Swerdloff et al. about an axis. Without such motivation, the rejection is improper and should be withdrawn.

Note that claims 6, 8 and 10 have been amended to clarify Applicants' invention by canceling a typographical error. Since the amendments do not change the intended meaning or scope of the claims, they are not being made for reasons of patentability as defined in *Festo.*

b. Claims 65 and 77

Claims 65 and 77 were rejected under 35 U.S.C. § 103 as being obvious in view of Swerdloff et al., Roos et al. and Dobbs. Applicants traverse this rejection. Claims 65 and 77 depend directly or indirectly on claim 63. As pointed above in Section C.1.b, there is no motivation to both 1) replace Swerdloff et al.'s slice-by-slice images with the computer tomography images of Roos et al. and 2) control the radiation path of Swerdloff et al. based on an image. Dobbs also does not cure the deficiencies of Roos et al. since it does not suggest replacing Swerdloff et al.'s slice-by-slice images with a computer tomography image and controlling Swerdloff et al.'s radiation path based on an image as recited in claim 63. Accordingly, the rejections of claims 65 and 77 are improper for at least the same reasons stated above in Section C.1.b.

The rejection of claims 65 and 77 is improper for the additional reason that there is no motivation in either Roos et al. or Dobbs to rotate Swerdloff et al.'s patient as mentioned above in Section C.4.a.

5. Swerdloff et al., Roos et al. and Rockseisen

Claim 13 was rejected under 35 U.S.C. § 103 as being obvious in view of Swerdloff et al., Roos et al. and Rockseisen. Applicants traverse this rejection. Claim 13 depends indirectly

on claim 1. As pointed above in Section C.1.a, there is no motivation to replace Swerdloff et al.'s imaging system with the imaging system of Roos et al. Rockseisen also does not cure the deficiencies of Roos et al. since it does not suggest replacing Swerdloff et al.'s slice-by-slice imaging system with a computer tomography system as recited in claim 1. Accordingly, the rejection of claim 13 is improper for at least the same reasons stated above in Section C.1.a.

6. Swerdloff et al., Roos et al. and Suzuki et al.

Claims 21, 22, 24 and 29 were rejected under 35 U.S.C. § 103 as being obvious in view of Swerdloff et al., Roos et al. and Suzuki et al. Applicants traverse this rejection. Claims 21, 22, 24 and 29 depend directly or indirectly on claim 1. As pointed above in Section C.1.a, there is no motivation to replace Swerdloff et al.'s imaging system with the imaging system of Roos et al. Suzuki et al. also does not cure the deficiencies of Roos et al. since it does not suggest replacing Swerdloff et al.'s slice-by-slice imaging system with a computer tomography system as recited in claim 1. Accordingly, the rejections of claims 21, 22, 24 and 29 are improper for at least the same reasons stated above in Section C.1.a.

7. Swerdloff et al., Roos et al., Suzuki et al. and Fujita et al.

a. Claims 23 and 25-27

Claims 23 and 25-27 were rejected under 35 U.S.C. § 103 as being obvious in view of Swerdloff et al., Roos et al., Suzuki et al. and Fujita et al. Applicants traverse this rejection. Claims 23 and 25-27 depend indirectly on claim 1. As pointed above in Section C.1.a, there is no motivation to replace Swerdloff et al.'s imaging system with the imaging system of Roos et al. Suzuki et al. and Fujita et al. each do not cure the deficiencies of Roos et al. since it does not suggest replacing Swerdloff et al.'s slice-by-slice imaging system with a computer tomography system as recited in claim 1. Accordingly, the rejections of claims 23 and 25-27 are improper for at least the same reasons stated above in Section C.1.a.

b. Claim 70

Claim 70 was rejected under 35 U.S.C. § 103 as being obvious in view of Swerdloff et al., Roos et al., Dobbs and Fujita et al.. Applicants traverse this rejection. Claim 70 depends indirectly on claim 63. As pointed above in Section C.1.b, there is no motivation to both 1) replace Swerdloff et al.'s slice-by-slice images with the computer tomography images of Roos et al. and 2) control the radiation path of Swerdloff et al. based on an image. Dobbs and Fujita et

al. each do not cure the deficiencies of Roos et al. since each does not suggest replacing Swerdloff et al.'s slice-by-slice images with a computer tomography image and controlling Swerdloff et al.'s radiation path based on an image as recited in claim 63. Accordingly, the rejection of claim 70 is improper for at least the same reasons stated above in Section C.1.b.

8. Swerdloff et al., Roos et al. and Richey et al.

Claims 32-34 were rejected under 35 U.S.C. § 103 as being obvious in view of Swerdloff et al., Roos et al. and Richey et al. Applicants traverse this rejection. Claims 32-34 depend directly or indirectly on claim 1. As pointed above in Section C.1.a, there is no motivation to replace Swerdloff et al.'s imaging system with the imaging system of Roos et al. Richey et al. also does not cure the deficiencies of Roos et al. since it does not suggest replacing Swerdloff et al.'s slice-by-slice imaging system with a computer tomography system as recited in claim 1. Accordingly, the rejections of claims 32-34 are improper for at least the same reasons stated above in Section C.1.a.

9. Swerdloff et al., Roos et al. and Brown et al.

Claims 71 and 72 were rejected under 35 U.S.C. § 103 as being obvious in view of Swerdloff et al., Roos et al. and Brown et al. Applicants traverse this rejection. Claims 71 and 72 depend directly or indirectly on claim 63. As pointed above in Section C.1.b, there is no motivation to both 1) replace Swerdloff et al.'s slice-by-slice images with the computer tomography images of Roos et al. and 2) control the radiation path of Swerdloff et al. based on an image. Brown et al. also does not cure the deficiencies of Roos et al. since it does not suggest replacing Swerdloff et al.'s slice-by-slice images with a computer tomography image and controlling Swerdloff et al.'s radiation path based on an image as recited in claim 63. Accordingly, the rejections of claims 71 and 72 are improper for at least the same reasons stated above in Section C.1.b.

D. Claims 78-80

Applicants note with appreciation that claims 78-80 have been deemed to contain allowable subject matter. Claims 78 and 80 have been amended to be in independent form and so should be allowed

Please not that the amendments being made to claims 78 and 80 are being made to incorporate subject matter that was inherently present in original claims 78 and 80. Accordingly, the amendments are not related to patentability as defined in *Festo*.

E. New Claims 94 and 95

New claims 94 and 95 depend on claims 5 and 65, respectively, and so are patentable for at least the same reasons that claims 5 and 65 are allowable as mentioned above in Sections C.1.a. and C.4.b.

Claims 94 and 95 are patentable over Swerdloff et al. for the additional reason that Swerdloff et al.'s system is inherently constrained to a circular trajectory with no mention of temporal localization on that trajectory. In contrast, the system of claim 94 and the method of claim 95 allow for combining the motion of a cone-beam and an object in such a way that it results in a cone beam or x-ray source moving upon a sphere. Since Swerdloff et al. is unable to achieve such movement, the claims are patentable over Swerdloff et al.

Note that new claims 94 and 95 are being presented to provide additional coverage for the radiation therapy system of claim 5 and the method of treating an object with radiation of claim 69. Accordingly, claims 94 and 95 are not being added for reasons of patentability as defined in *Festo*.

F. New Claims 96-102

New independent claim 96 recites controlling a radiation therapy treatment plan involving the radiation source based on an image generated from a cone beam of x-rays. Swerdloff et al. does not disclose nor suggest controlling a radiation therapy treatment plan based on an image generated from a cone beam of x-rays. Without such suggestion, claim 96 and its dependent claims 97-102 are patentable over Swerdloff et al.

Note that new claims 96-102 are being presented to provide additional coverage for a method of treating an object with radiation. Accordingly, claims 96-102 are not being added for reasons of patentability as defined in *Festo*.

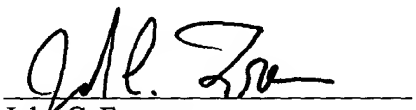
G. Statement of Reasons for Allowance

It is noted that a statement of reasons for allowance for claims 78-80 have been given. Applicants traverse the statement to the extent that there are other and broader reasons for the allowance of the claims.

CONCLUSION

In view of the arguments above, Applicants respectfully submit that all of the pending claims 1-23, 26-35, 64-80 and 94-102 are in condition for allowance and seeks an early allowance thereof. If for any reason, the Examiner is unable to allow the application in the next Office Action and believes that an interview would be helpful to resolve any remaining issues, he is respectfully requested to contact the undersigned attorneys at (312) 321-4200.

Respectfully submitted,



John C. Freeman
Registration No. 34,483
Attorney for Applicant

BRINKS HOFER GILSON & LIONE
P.O. BOX 10395
CHICAGO, ILLINOIS 60610
(312) 321-4200